Regulation, competition and integration in electronic payments markets: the Spanish and European cases

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Abstract

The instruments used by regulators to promote competition and integration in the face of problems such as those related to payment methods can generate disincentives, especially in the absence of adequate information to guarantee the rationality of agents. This is particularly relevant because these markets exhibit particularities and asymmetries that differentiate them from other more traditional markets (different sides, network economies, cross-transfers, hidden costs, large externalities, and so on), characteristics which make them more dependent on the quality and quantity of information. Therefore, when this information is inadequate, more failures than can be solely attributed to market regulation tend to occur. In this paper we argue that interventions in "two-sided" payment cards markets (2SMs) to reduce costs to merchants may in the end harm the interests of consumers and discourage penetration of cards as a payment method and their increased use in retail operations. In our study we analyze and simulate the effects of the legislative package on electronic payments proposed by the European Commission in July 2013, which seeks to force a top-down convergence, similar to that designed for domestic interest rates with the euro, and which has proven to be a failure during the recent debt crisis.

1. Two-sided markets (2SMs): market and State failures

Means of payment markets, and more specifically those of card payments, can be characterized as bilateral markets or "two-sided markets" (2SMs). The academic literature on 2SMs is one of the most extensive and rapidly growing in economics: at the beginning of December 2013 Google registered almost 67,000 citations about 2SMs, of which nearly one-tenth referring to an academic context, where the term is used to describe a number of increasingly extensive sectoral markets (M. Rysman, 2013)[2]. Research or forums promoted by the OECD noted some years ago the application of these markets in dozens of sub-sectors (OECD, 2009)[3], although most of them were service or tertiary markets, where the cases most frequently analyzed were the markets of payment cards, real estate agents, video game console software, advertising and on-line auctions or dating agencies.

1.1 Most relevant theories

Throughout this literature there is a broad consensus in attributing at least the following seven characteristics to two-sided markets, which we propose to explain from an economic-structural perspective:

[2] Rysman, M (2013): *Economics of Payment Cards,* with Julian Wright, October 2013, submitted.

[3] OECD (2009), *Two-Sided Markets.*

-They are made up of **different types of agents**; not only the main ones (producers-consumers, merchants-users, etc.), but also others such as providers of other services. The literature on payment cards is one those that has most contributed to the concept and study of 2SMs.

- They facilitate the **interconnection of these agents**, which is often done by the use of platforms, which provide a common meeting place (real or virtual) where different customer groups may interact, so that in principle they represent an instrument to reduce transaction costs among the participants.

-The relationship between agents is also **facilitated by information**, **which is now seen as an institution** or superstructure and not mere infrastructure, apart from that which moves on platforms where relationships are created. Information, as we shall see, is a crucial element not only to justify prices and price formation, but also to explain the failures of other institutions, such as the market or the State, often as a result of interventions. These "solutions" in any case affect competition, and hence the bulk of the literature on 2SMs effectively deals with competition.

-Thus, 2SMs **form networks** (types of relations: structures and systems), as also confirmed by the fact that the vast majority of the academic literature attributes to them **network economies**, enhanced by the use of information that benefits the two main interconnected parts (the case of businesses and consumers in the cards market, for example). Such economies belong to the so-called new economy, understood as an information economy driven by knowledge (Terceiro and Matías, 2001)[4], and which are clearly different from the more traditional economies of scale or scope, characterized as energy-driven economies. For example, Metcalfe's Law, stating that the value or usefulness of a network grows as a square of the number of users, boosted by other laws emerging from the information economy, such as Moore's law (each year and a half the power of computer processors doubles).

-These 2SM platforms **contribute to creating pricing structures**, that is, to structuring the information that most interests the markets and their agents. Therefore, they also structure prices through the various incentive schemes and orientations they generate. As noted by R. Seamans and F Zhu (2011)[5] *"One of the empirical challenges associated with studying multi-sided markets is collecting price data on all sides of the market".*

-Such pricing structures are **influenced by side effects and externalities or external economies,** as are those of income and welfare of agents. These can be positive (reducing crowds, traffic or pollution, for example) or negative (new external costs such

[4] José B. Terceiro & Gustavo Matías (2001), *Digitalismo, Taurus Ediciones, S.A.-Grupo Santillana, 319 pages.*

[5] R Seamans, F Zhu (2011), *Technology Shocks in Multi-Sided Markets: The Impact of Craigslist on Local Newspapers.*

as time and "shoe leather" which the consumer must spend looking for cash at ATMs, as an alternative to use of cards or other means of electronic payment). But also the side effects of rational choice among agents can be very important, such as tax evasion or labour fraud, or larger submerged and illegal or even criminal economies which take advantage of cash, which lacks the transparency and traceability of electronic payments, except those made in some new form of electronic money such as *bitcoins*.

-In pursuing gain in each and every one of the above features, 2SMs **generate innovation** because previous network economies and their externalities can cause both problems as well as benefits. Some already-cited network economies may also create diseconomies: the privacy and security of a network is inversely proportional to the number of nodes in the network; hence the relevance of innovation and its influence on their distribution.

1.2 Failures of the Market and the State

In addition to seeking the optimal functioning of 2SMs, theories - just like empirical studies - try to identify whether they produce both market failures and regulatory intervention. The character of 2SMs produces the paradox that, as instruments to organize and structure information, they themselves generate information asymmetries. *"There is no apparent basis in today's economics - at a theoretical or empirical level - for concluding that it is generally possible to improve social welfare by a noticeable reduction in privately set interchange fees*", conclude Richard Schmalensee and David S. Evans (2005)[6]

The **two main market failures arise from access to and use of information** by agents, which limit their logical use, hampered by the fragmentation of the markets. This is the case of **adverse selection** (doing business with people that are best avoided) and moral risk. Adverse selection can be a problem when there is asymmetric information between the seller and the buyer, since a good or service can be profitable for buyers only when they have adequate information about the risks it incurs. Moral hazard means that an agent performs actions that the other cannot handle even when covered by insurance. In both cases there is asymmetric information which generates instability that often leads to market failures. But the State can also cause failure, such as when government regulation or intervention leads to imperfections of information or practices of regulatory capture. In such cases market forces – that is, the power of the market expressed in monopolistic competition methods or practices in supply and demand - fail to be corrected.

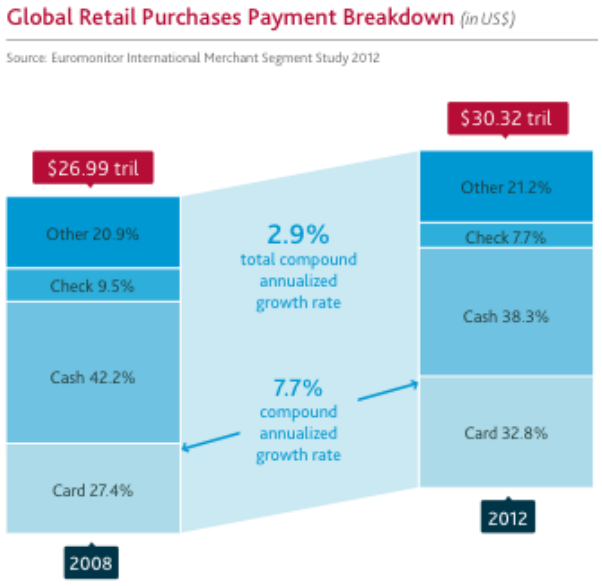
[6] Schmalensee and Evans (2005): *The Economics of Interchange Fees and their Regulation: An Overview*, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=744705

2. How prices are formed in the two-sided cards market

The electronic payments market is not only a good example of a 2SM, but most of the literature deals with this type of institution, in analyzing how prices are formed and structured. Most of the theoretical and empirical literature focuses on **three main models**, where primarily the prices based on **interchange fees**, **merchant service charges** and consumer **price discrimination** are analyzed

This literature reflects the worldwide turmoil in recent years caused by the rapid advance in the process of replacing cash, accelerating globally even during the years of crisis with the presence of internet and mobile phone payments, which have attracted new operators (Paypal, telecommunications companies and ICTs such as Google) and boosted already existing or incumbent operators. The replacement of cash by electronic payments has accelerated, as shown by the volume of payments throughout the economy, but particularly in terms of card payments related to private consumption and retail.

Even in the first four years of the recent crisis, card payments have increased from $ 7.4 trillion - 27.4% of all retail payments - in 2008[7] to almost 33%, $ 9.9 trillion in 2012, with an annual growth of 7.7%, more than double that other forms of payments (average 2.9%), whereas in the case of cash over the same period its share went down from 42.2% to 38.3%.



In any case, the bilateral card market **takes different forms depending on the participants**: there are two-party, three-party and four-party schemes. The most widespread are those that involve more parties - Visa or MasterCard bank cards - because participating on the one hand there are banks and consumers, and on the other there are acquiring banks and merchants. In three-party schemes a commercial company

[7] Euromonitor (2012*), International Merchant Segment Study,* cited by Moodys Analytics (2013): *The Impact of Electronic Payments on Economic Growth*

provides services directly to consumers and merchants (American Express and Diners Club, for example)[8]. In two-party schemes only consumers and businesses are involved, the businesses issuing their own "private" cards. The latter account for nearly a quarter of all those in Spain; the three-party schemes (primarily American Express) have a 1-2% share; and the rest are what are known as "bank cards" [9], the only ones on which are published official statistics concerning number, transactions and fees. Four-party schemes employ both **debit cards** (in the majority and the fastest growing) as well as **credit cards**.

2.1 Theoretical models

Of the three models mentioned above, the first dates back to the contributions made decades ago by Baxter (1983), a pioneer in justifying the **necessity of multilateral interchange fees** (MIFs).

Each time a commercial transaction occurs, the issuing bank (on behalf of the cardholder) pays the acquiring bank (on behalf of the merchant) for the value of the service or product purchased less the MIF. This is the payment for the issuer.

Similarly, the acquiring bank retains a portion of the money received from the merchant, called the **merchant service charge** (MSC)[10]. These fees, therefore, are usually larger than interchange fees, since theoretically they encompass both the remuneration of the issuer as well as that of the acquirer, for facilitating the means of payment to the merchant and for providing him the payment days, weeks or months in advance of the consumer's payment.

In practice, both fees are complemented by the banks with other income in the form of fees for other services related to cards, received from the consumer by the issuing bank and from the merchant by the acquiring bank, an issue which will be discussed later in detail.

[8] In the four-party system, the issuer has a contractual relationship with the cardholder and the acquirer has a contractual relationship with the merchant. In the three-party system the network acts as issuer and acquirer and has a direct contractual relationship with the cardholder and the merchant; a variant is the three-party model where other service providers obtain an issuing and/or acquiring license (called "three-party card networks with licensees"), according to the definition of the ECB. Among the three-party networks operating in the EU are American Express and Diners Club, while the four-party networks include Visa Europe, MasterCard and the vast majority of domestic networks. The three-party networks are basically credit card networks, while the four-party networks are debit card and credit card networks. Older Member States still have at least one domestic card network that only allows domestic payments. This is the case, for example, of Belgium, Denmark, Germany, Ireland, Spain, France, Italy and Portugal.

[9] DBK: *Competitors: tarjetas de pago*, 2007.

[10] In the European literature this is known as the *merchant service charge* (MSC), while in the American literature it is called the *discount fee* (DF).

The function that Baxter attributed to MIFs is addressing those market failures caused by negative externalities (such as the so-called "shoe leather costs" which payment cards save), in the face of which these fees have the potential to align benefits and social costs.

Along the same lines, some theorists argue that MIFs and MSCs are needed to encourage the use of electronic payment methods, while others claim that MIFs artificially inflate the cost of accepting cards. But, for most analyses, the key is precisely the fact that the bilaterality of the market makes strategic interaction difficult, not between the acquiring or issuing bank and the consumers and merchants but between the latter two - the main agents of retail trade - with their different interests. The most significant authors who reject this strategic interaction are Rochet and Tirole (2006)[11] (supplemented in 2010), and Verdier (2009)[12]. However, Wright (2001)[13] previously stated that, despite the acknowledged difference of interests, MIFs and MSCs help maximize the volume of payments by bringing the interests of both parties into balance.

The third model is based on the dynamics of surcharges or **price discrimination** (selling the same units at different prices), consisting in assigning different prices for the same service to maximize revenues, from lower prices to buyers with maximum market power to linear prices which do not discriminate against the consumer.

In summary, the discussion of the above three models of pricing revolves around **two fundamental issues**, which can be expressed as a single idea: how to ensure **efficiency** without affecting free **competition**. There is a broad consensus that the lowest level of government intervention and an increased transparency in pricing schemes contribute significantly to the efficiency of payment schemes, aided by product innovation.

No less important in the academic debate is the question about **whether MIFs should be set bilaterally or multilaterally**. Even from the majority view that the balance between the value achieved by consumers and merchants should be achieved in heterogeneous markets and situations of underuse or overuse should be avoided, it is recognized that it is not the same to maximize profits, fees or welfare. This is accepted by Schmalensee (2001), Wright (2004) and Rochet and Tirole (2006), and even Evans, who is more sceptical with respect to reaching an optimum in any of the schemes, and

[11] Rochet, Jean-Charles, y Tirole, Jean, *Two-sided markets: a progress report*, The RAND Journal of Economics, Volume 37, Issue 3, pages 645–667, September 2006, supplemented by *PLATFORM COMPETITION IN TWO-SIDED MARKETS*, Journal of the European Economic Association Volume 1, Issue 4, article first published online: 13 DEC 2010.

[12] Verdier, Marianne, *Interchange fees in payment card systems: a survey of the literature*, Journal of Economic Surveys, Volume 25, Issue 2, pages 273–297, April 2011.

[13] Wright, Julien, *The Determinants of Optimal Interchange Fees in Payment Systems*, Economics Working Papers, University of Auckland, j.wright@auckland.ac.nz

even less by reducing MIFs. But Chakravorti (2003), Chakravorti and Roson (2006), Schwartz and Vincent (2006), Guthrie and Wright (2007), Chakravorti (2007), Bolt and Chakravorti (2008a; 2008b), Marquez (2009) and Rochet and Wright (2009; 2010) have commented on their impact on social welfare and consumer credit.

2.2 Empirical models.

However, **most theoretical models have not been subjected to empirical tests**, even those which argue the benefits of reducing MIFs at all costs. Furthermore, even taking into account different costs for different payment methods, they **differ in approaches and definitions** used, especially in the face of a more general but interesting problem related to the optimizing of payment schemes: the replacement of cash by electronic money.

In the empirical analysis of the costs and benefits of this method of payment compared to others see Humphrey et al. (2006), García-Swartz et al. (2006) and Bergman et al. (2007).

Faced with such an approach, others have observed that usually the merchant charges the same price, regardless of the type of payment method used by consumers (Bolt and Chakravorti, 2008b). Hence, merchants have tended to find three solutions in order to reduce their costs related to the means of payment and recoup the MSC that the acquiring bank charges them on card sales:

- Claim a reduction in MSC reducing the MIFs paid by acquiring banks to issuing banks.
- Discourage the use of bank cards by technical constraints or offer discounts to those who use cash.
- Apply surcharges to the client to claw back the cost of the MSC, a practice that is used alongside those above in some countries (Chakravati and Shah, 2003), but which was prohibited in Spain until June 18, 2010 (Article 24.3 of the Ministerial Order on transparency which extends law 16/2009 on Payment Services), although since 2012 the Government has announced that it will use the new Consumer Act to prohibit surcharges in electronic commerce.

Therefore, the theoretical and empirical literature focuses primarily on the merchant and his decision whether or not to accept cards and/or evade their cost. The former tends to focus in MIFs as the most relevant of card costs, whereas the empirical literature does the same in respect to MSCs and deals with the practices that attempt to avoid the impact of these charges.

2.3 Other direct and indirect costs

The above discussion highlights that we are looking at markets and agents that can be characterized not only by the formation of bilateral or two-sided markets around

merchants-acquiring banks, and consumers-issuing banks, but also by the imposition of other direct and indirect costs; these usually derive from asymmetries in market power and the use of information, and are summarized below:

-Create **subsidies or cross-subsidies** of income among agents.

-Register a **multiplicity of prices as primary incentives**, either simultaneous or alternative: MIF between issuing banks and card acquirers, MSC between the acquirers and the merchants, surcharges by merchants, issuing commissions, maintenance fees, interest on credit cards, arrears charges or reclamation of balance commissions, prizes, commissions for installing and maintaining cash terminals, commissions for withdrawing cash... to name just a dozen of the main costs that have surfaced in the market.

- Complement these prices, costs or incentives with contracts containing hidden costs, mainly including seigniorage and the decline of income or the increase in public expenditure derived from the costs of the underground economy which functions via the principal alternative means of payment: cash.

-The numerous and **high externalities or external economies** already indicated, such as the so-called "shoe-leather" costs or savings, or those of fraud, traffic, pollution, etc.

-The **significant presence of other practices that affect regulation and competition**, in addition to cross-subsidies and externalities, such as mainly **economies of scale** and **network economies**, as well as the new rules of the **information economy** and of **spirals of innovation** (highly relevant in payment networks today which operate via Internet, and to which a quarter of world economic growth in the last decade is attributed), **price discrimination**, **predatory pricing**, **opportunity costs** and many others.

-The **increasing controversial attempts at public intervention on fees**, most of which have been registered in member countries of the European Union (including Spain from 2005 to 2010), **without the presentation of a theoretical or empirical analysis** of cases or effects.

- Attempts at intervention by the European Union to extend the regulation not only of fees, but of the aforementioned rules of competition (facilitating the entry of Internet businesses, separating businesses, HCR, etc.) without providing any theoretical support showing that the alleged greater opportunities for entrants to compete with incumbents will be effective in lowering prices and improving service. Not only in these sectors, but also in others which have been regulated in this sense during the last two decades (telecommunications, energy, banking, etc.), have serious criticisms been raised about whether the approaches taken have actually improved the position of consumers.

From the extensive economic literature on all these costs (ECB[14]) can be derived a table of four agents and thirty major costs (excluding those transferred between agents) as shown in the following table:

Agents	**Type of private cost**	**Income/Cost**
Central Bank	Internal Costs	Production of coins and notes
		Distribution of cash
		Inspection of forgery, storage and destruction of damaged notes
	Transfers	Seigniorage in the internal cash holdings
		Seigniorage in foreign currency holdings
Retail banks /Distribution companies	Internal costs	Distribution of cash (cash machines/ bank branches)
		Receiving and processing commercial deposits
		Card production and distribution
		Authorization of card payments
		Provision of POS terminals to businesses
		Processing costs
		Fraud prevention costs
	Transferences	Income from commissions on deposits
		Income from commissions on purchases
		Income from card commissions
		Income derived from delay between sale and reimbursement
		Loss of interest of cash holdings
Merchants	Internal costs	Cost of time required to make a payment
		Clearing of cash registers, collection and deposit of bank surpluses
		Losses due to theft and forgery
		Card terminals, if these are not provided by the bank
		Communication costs
	Transferences	Deposit fees
		Commercial services fees
		Loss of interest of cash holdings
Consumers	Internal costs	Cost of time required to make a payment
		Cost of obtaining money (Cash machines/ bank branches)
		Fraud /Loss/Theft of money
	Transferences	Commissions for transactions and cards
		Loss of interest of cash holdings

Source: Costly Cash: a synthesis of international evidence on the cost of making payments, 2011

[14] European Central Bank (2012), 'The social and private costs of retail payment instruments, a European perspective'

3. Impact on the consumer

The end consumer ends up paying all costs, including those of 2SM platforms, in the final price.

It is obvious that when setting their prices companies *try* to cover all costs incurred, both fixed and variable, adding a margin and trying to maximize their profit. We have stressed the word *try* because companies always act subject to the restrictions of market competition, depending on their "market power" in setting prices. This performance strategy is incorporated into some theoretical models which have led over time to a variety of different approaches in economic theory.

As Kalecki (1956)[15] noted, variations in the prices of manufactured products are determined by the costs in the short term. On this basis, he puts forward a model in which companies set their selling prices (P) based on their costs (U) and a certain weighted average of the selling prices of the competition (PC)

$$P = m\,U + n\,PC$$

where m and n are coefficients whose value determines the margin of the company and that this will be fixed depending on its market power.

Alternatively, Eichner (1973) [16] notes that in a monopoly or oligopoly market structure, a company uses its market power to set prices above marginal cost μ, using the well-known margin model (or mark-up model, formulated in its original version by Hall and Hitch, 1939),

$$P = (1+\theta)\,\mu$$

θ being the percentage of the margin (θ> 1)

As an alternative formulation of the margin model, companies set their selling price based on their variable costs (Uv)

$$P = Uv\,(1 + \theta)$$

Since the variations in costs cannot be transferred automatically to the prices, to the extent that the company has the capacity to vary its margin, the prices can also be modified, and which in the end will depend on both factors. And, without doubt, competition is the key determinant in the capacity to set business margins.

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[15] M. Kalecki (1956), *Teoría de la dinámica económica: ensayo sobre los movimientos cíclicos y a largo plazo de la economía capitalista*, Fondo de Cultura Económica, México.

[16] Eichner, A. S. (1973), *A Theory of the Determination of the Mark-up Under Oligopoly*, Economic Journal, 83(332), December.

Of course there are many other factors that affect pricing. For example, those affecting the variation in prices (Klenow and Malin, 2010)[17], such as the level of and changes in inflation, the frequency and magnitude of cost and demand shocks, the structure and degree of market competition or the methods used in the preparation of official statistics.

But returning to two-sided markets (four-party), if companies shift (or attempt to shift) all their costs (particularly variable costs) onto the selling price, this implies that it is the consumer who ends up supporting all the costs the company has incurred, including specifically those costs generated by the means of payment used by the consumer to pay the final price of the good or service. One of these costs is the merchant service charge (MSC) that the commercial sector supports but in the end is just shifted onto the final price paid by the consumer when a card is used as a means of payment. So, too, the consumer ends up paying the increased costs to the commercial sector when cash is used to make a payment. Likewise, the consumer ends up paying the cost of the electricity used in lighting stores. The same is true of many of the types of costs in incurred by the issuing banks and acquiring banks negotiating with merchants to install point of sale (POS) terminals, as could equally be said of those who have installed ATMs for cash withdrawals by consumers. All of these costs are finally reflected in the end price paid by consumers. But although all the costs are transferred to the selling price, this does not mean that the company will be indifferent and will accept any level of costs: on the contrary, since if the company does not adequately monitor its costs it will become uncompetitive and lose market share.

4. The costs of payment methods

The recent literature on means of payment insists on distinguishing between private costs for agents and costs for the entire economy, also known as social costs[18], for example ECB (2012). But a detailed reading leads to the conclusion that it only estimates production costs of all agents, excluding consumers, assigning an annual total of 130,000 million (1.15% of GDP), with the following breakdown: 50% banks, 46% merchants, 3% central banks and 1% cash carriers[19].

[17] P.J. Klenow, B.A. Malin (2010), *Microeconomic evidence on price-setting*. Working paper 15826. National Bureau of Economic Research. March.

[18] The literature often uses the terms *social cost* and *cost for the entire economy* interchangeably. But according Dot.econ (2011), "*Costly Cash: a synthesis of international evidence on the cost of making payments*," the social cost should include, in addition to the sum of the internal costs of all agents other costs included in Table 1, such as the underground economy associated with the use of cash or seigniorage.

[19] ECB: The social and private costs of retail payment instruments, Occasional Paper No 137, September 2012. In footnote 3 of the study, the ECB recognizes that "the social costs of payment instruments to households and consumers are beyond the scope of the current study".

Other estimates by *Retail Banking Research* (RBR) in *The Future of Cash and Payment*, place the total cost of cash (only considering distribution, management, handling, processing, recycling and acceptance) at 0.6% of GDP, equivalent to €130 *per capita*. Therefore, if debit and credit cards were to equal this figure (adding another €130 *per capita*), the total cost would be close to 65,000 million Euros.

Against this, the impact report *Payments legislative package - 24.07.2013* [20] estimates that MSCs will reach 14,000 million Euros per year and MIFs about 10,000 million. What the Commission intends is to reduce both fees to save merchants around 6,000 million Euros per year, although it does not provide any estimation of how issuing and acquiring banks of debit and credit cards will respond to this.

If this were put into practice in a way similar to the reduction imposed in Spain (Iranzo *et al*, 2012)[21] by a forced agreement between merchants associations and schemes to compensate for the loss of this 6,000 million Euros per year, banks would raise fees for the emission and maintenance of cards for consumers, and fees for POS terminal installation and maintenance for merchants. But in addition, the total volume of transactions and the replacement of cash by cards would slow down, with the consequent negative impact on the underground economy and tax revenues[22], as well as a relative increase in the proportion of 100 and 500 euro banknotes.

Of course, as a compensating mechanism, banks could also increase other revenues as discussed in Chapter 4, by means of the income from interest rates on credit cards. But among their list of possible compensatory resources banks possess over a dozen commissions which can be raised to avoid losing revenue. Otherwise, both these entities as well as many other large operators would incur large reductions in revenue and even losses in the payment cards business.

In any case, up until now there has not been enough information to even estimate other possible effects on other costs not previously considered, which would in principle be all those in Table 1, which are largely excluded even as private costs. In a full estimate, to these would have to be added internal costs and transfers or offset costs. In this way the sum total of economic costs could be arrived at, which together with externalities and opportunity costs would give us a more complete picture of the entirety of social

[20] http://ec.europa.eu/internal_market/payments/framework/index_en.htm

[21] Iranzo J., Fernandez P., Matías G. and Delgado M. *The effects of the mandatory decrease of interchange fees in Spain*. July 2012. MPRA Paper 43097. University Library of Munich, Germany. Website: http://mpra.ub.uni-muenchen.de/43097/; Econ Papers website: http://ideas.repec.org/p/pra/mprapa/43097.html

[22] Ruesga, S. and Carbajo, D. (2013), *El "tax gap" en España. Definición, estimaciones y medidas dinámicas para su reducción.*

costs. Precisely in this study we aim to address this lack of information in the European Union.

5. Historical intervention in MIFs

Governments considering market interventions rarely use theoretical models to fix MIFs, nor does the European Commission with its aforementioned proposed legislative package. Justifications tend to focus on the benefits to competition, consumers, innovation, promotion of means of payment, and so on, although the consequences tend not to have been adequately studied, with some exceptions such as those of Spain, Australia and the U.S.

Since the 1970s a strong controversy has developed over whether MIFs and their translation to MSCs undermine competition. The first country to regulate MIFs was Norway in 1989. The most well-known and significant interventions were conducted in Australia, Spain and the U.S., in addition to more than thirty countries worldwide.

The European Commission, for example, before the legislative package proposed in July 2013, spent nearly a decade reducing cross-border MIFs. A study of the Payments System Board of the Reserve Bank concluded that MIFs were too high and did not conform to the rules of competition. For this reason in 2000 Visa and MasterCard were forced to remove their "no surcharge rules"[23] and reduce their MIFs. Many authors, most recently Evans *et al* (2011)[24] have pointed out that the theoretical basis of such measures is far from clear, including the further proposal for reduction of MIFs in the U.S. (Federal Reserve System, 2010)[25].

What is considered reasonable by many academics would be achieving a more socially efficient structure for the entirety of fees, not simply reducing one or another, to give in the end a greater weight to consumers, as indicated by Evans, Litan and Schmalensee

[23] Known in the literature as the *no-discrimination rule* (NDR) it prohibits merchants surcharge card payments over other payment methods to try to recover the cost of the MSC.

[24] Evans, David S., Litan, Robert E., Schmalensee, Richard, *The Economic Principles for Establishing Reasonable Regulation of Debit Card Interchange Fees that Could Improve Consumer Welfare*. Submission to the Board of Governors of the Federal Reserve System, February 22, 2011.

[25] Federal Reserve System. 12 CFR Part 235 *Debit Card Interchange Fees and Routing*. Proposed Rules. [Regulation II; Docket No. R–1404]. RIN 7100–AD63. Federal Register. Vol. 75, No. 248. Tuesday, (December 28 2010)

http://www.federalreserve.gov/boarddocs/meetings/2010/20101216/20101216_InterchangeFeeProposedRuleDRAFTFRNotice.pdf

2011)[26], in the already cited report by the Federal Reserve System (2010), or, earlier, Stillman *et al* (2008)[27].

The rules on intervention sometimes have been agreed after long public debates, but they have never been accompanied by the corresponding reports of benefits and costs, despite affecting the interests of consumers, merchants and issuers or acquirers of credit cards. Nor do we find rigorous and thorough evaluations of the expected results for the whole economy and society in general.

6. The payment cards market in Europe. Costs and Revenue

We will analyze the characteristics of different national payment cards markets in Europe, studying the most important countries in terms of their volume of card payments and trying to identify to what extent the "European market" can generally be characterized.

According to the European Central Bank data (Table 6.1), by 31 December 2011 there had been a volume of card payments through point-of-sale (POS) terminals of nearly € 2 trillion in the European Union. However, there are significant differences between the 27 member states. The country where the most payments are made (see Annex, Table A1) is the UK, with nearly 30.2% of total payments in the EU, followed by France (more than 20.6%). Germany, Italy and Sweden together represent a volume of payments similar to that of France. Spain, the fifth largest volume in the European market represents just 5.5% of the total. But, as we shall see later, despite the great importance of the UK and French markets, it is the other countries where the penetration of payment cards is higher.

Table 6.1. Value of transactions per type of payment cards in the EU. 2011

TOTAL Billed Volumes at POS	Billed Volumes DEBIT	Billed Volumes CREDIT(1)	% Credit / Total	Per capita TOTAL B.volumes	Per capita DEBIT B.volumes	Per capita CREDIT(1) B.volumes
1915245	1186837	728408	38.0%	3.812	2.362	1.450
millions of euros				thousands of euros		

(1) Including debit delayed.

Source: European Central Bank, Eurostat and own calculations

[26] Evans, David S., Litan, Robert E. and Schmalensee, Richard, *The Economic Principles for Establishing Reasonable Regulation of Debit-Card Interchange Fees that Could Improve Consumer Welfare* (February 22, 2011). http://ssrn.com/abstract=1769890 o http://dx.doi.org/10.2139/ssrn.1769890

[27] Stillman, Robert, Bishop, William, Malcolm, Kyla and Hidebrandt, Nicole, *Regulatory Intervention in the Payment Card Industry by the Reserve Bank of Australia. Analysis and evidence*. CRA International. London, April 28. 2008

In the EU the debit card is used to a greater extent: 62% of the volume of transactions in 2011were debit transactions with the remaining 38% being credit and deferred debit operations. But in some countries the situation is reversed: thus, credit and deferred debit account for up to 83% in Greece, 69% in France and 58% in Spain and Luxembourg, and close to 50% in Cyprus, Malta, Italy and Ireland. In the rest of the EU debit transactions overshadow the other types.

The use of cards as a payment method seems to be related to the higher income level of different countries, although there are some notable exceptions. In *per capita* terms, the average expenditure via payment card in 2011 was 3,812€, but within a very large range: the country where the per capita expenditure is highest is Luxembourg (11,070€), followed by Denmark, Sweden and the UK (between 10000-9000 €/pc). Then come Finland, France, Holland, Belgium, Portugal and Ireland (6700-5100 €/pc) with Spain, Germany, Estonia and Italy between 2,300 and 2,000 €/pc.

Regarding the total number of payment cards, at the end of 2011 there were 726.6 million cards in the EU, of which 460.7 million were debit cards (63.4%) and 249.3 million were credit cards (36.6%) (See table 6.2 and Annex A2). In *per capita* terms this represents an average1.4 cards per person (0.9 credit and 0.5 debits). In comparison, in the U.S., Australia or the United Kingdom where card usage is more widespread, there are 2.6 cards *per capita*.

Table 6.2. Number of cards in the EU. 2011.

TOTAL Number of cards	**DEBIT Total cards**	**CREDIT Total Cards**	**% Credit / Total**	**Per capita TOTAL Cards**	**Per capita DEBIT Cards**	**Per capita CREDIT Cards**
726.572	460.727	265.845	36.6%	1.4	0.9	0.5
millions				number of cards		

Source: European Central Bank, Eurostat and own calculations

During any one year there are a huge number of card transactions in the EU (over 37 billions, Table 6.3). Debit cards are used much more than credit and deferred debit cards; approximately 2.5 times more. However, the average payment using credit cards and deferred debit cards is notably higher than that of debit cards 66 Euros versus 45 Euros).

Perhaps the best indicator to measure the varying use of cards as a means of payment is the number of payments *per capita* in a year. In the EU, the average number of payments *per capita* is 74 payments a year, of which 52 are debit and 22 are credit and/or delayed debit. However, in those European countries where use of cards is most widespread (see Table A3 in the appendix), where more payments per capita are made -

Denmark, Sweden and Finland - this number reached more than 200 payments in 2011. Also with a very high volume of payments, between 160 and 120 payments *per capita*, are the UK, Holland, Estonia, Luxembourg, France and Portugal. Below the average, with around 50 payments a year *per capita* come Austria, Spain, Slovenia, Cyprus and Lithuania. Well below the average is Germany with 36 and Italy with 26 payments *per capita*. In Greece, Bulgaria and Romania the *per capita* figure was less than 10 payments per year.

Table 6.3. Number of transactions per payment card in the EU. 2011.

TOTAL Card Payments	DEBIT Card Payments	CREDIT Card Payments	TOTAL average payment	DEBIT average payment	CREDIT average payment	Per capita TOTAL payment	Per capita DEBIT payment	Per capita CREDIT payment
37154	26090	11064	51	45	66	74	52	22
millions			euros			number of payments		

Source: European Central Bank, Eurostat and own calculations

With regard to the total number of payments differentiated by types of cards, data for debit card payments are very similar to the total payments, discussed in the previous paragraph. Regarding credit card payments, it is worth noting the high volume differential with respect to the EU average (19 credit payments *per capita* in 2011) in some countries: Luxembourg (66), France (51), the UK and Sweden (37), Spain (29).

As we can see with these data, the average of the EU is scarcely representative: it does not characterize any of the 27 countries studied, not even the United Kingdom and France, which together represent over 50% of the market volume.

7. Differences in income and profitability indicators

We have conducted a detailed analysis of the various sources of revenue, cost and profitability of the various European countries. Unfortunately, we have not been able to do this for all types of payment cards due to lack of statistical data. We have only been able to find detailed information for credit cards and deferred debit cards. These, as we have seen, represent 38% of the total volume of card transactions in the EU. Our study includes the twenty largest national EU markets[28], which represent 99% of the total volume of payments in the EU.

Differences between the countries of the EU are very significant, not only from the point of view of the availability or use of credit cards as a method of payment, but also with respect to the structure of the revenues and costs in each country and with respect

[28] We used a database with information on the use of credit cards for the twenty largest countries of the European Union, all part of the EU27 but excluding Luxembourg, Bulgaria, Estonia, Latvia, Lithuania, Cyprus and Malta.

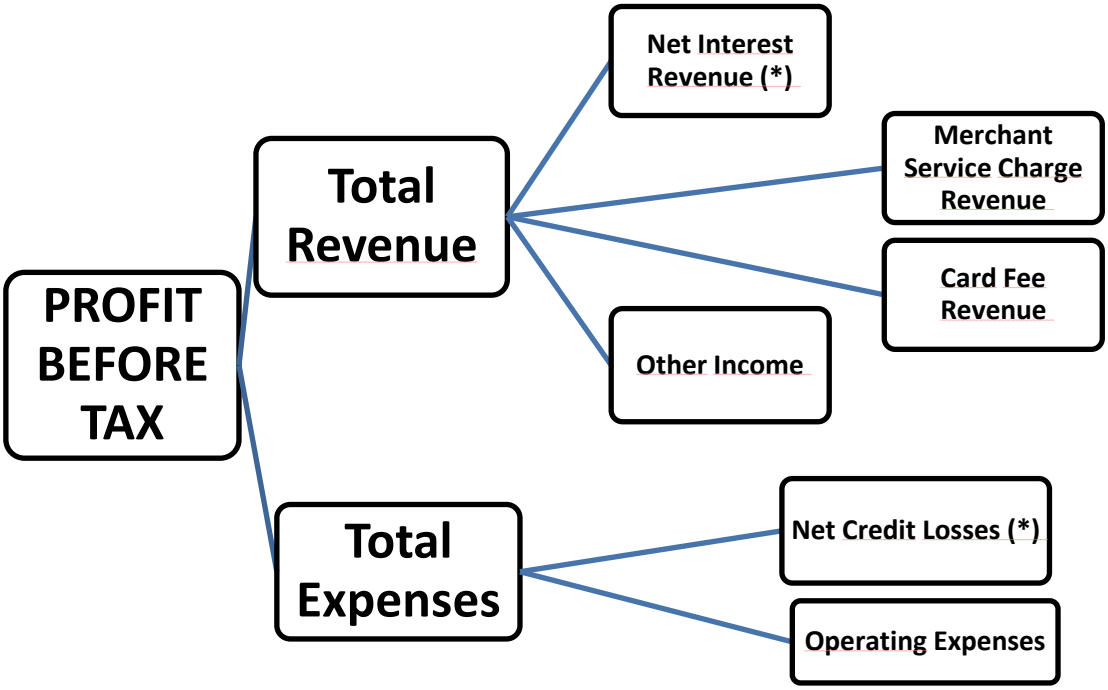
to the profitability of each of the credit card markets. All this is related to different models of revenue (commissions) and cost structures and with patterns of card use in each country.

Income sources and their characteristics are as follows: some revenue occurs on an irregular basis (such as Card Issuance Fees); other revenue occurs only once a year (Card Maintenance Fees) and other income depends on the volume of payments and are made for each specific operation (income from Merchant Service Charges).

Other types of income depend on whether the user decides to finance a purchase by credit or not, a decision which may vary for each specific transaction, along with the credit period, which will determine the Credit Interest Income (which we have computed net of cost of funding). Finally, in the concept of Other Income we have gathered a set of variables that incorporate other fees such as those charged by currency exchanges (if the card is used to make payments in a currency other than that of the country where the card is issued), fees for overdrafts, fees for reimbursements, fees for using the card to withdraw cash at ATMs, and others.

And on the cost side we have differentiated between Net Credit Losses (just for credit) and Operating expenses.

Structure of revenue and cost in payment transactions by credit card and debit card



(*)Not applicable for debit transactions.

In terms of the EU average (Table 6.4), 49.2% of the revenue comes from Credit Interest, 21.1% from MSCs, 14.9% from Other Fees and the remaining 14.4% from Card Maintenance Fees. As we can see, the Merchant Service Charges are by no means the most important source of income. The most significant overall is income from credit interest, although this varies for each country analyzed. Thus, income from credit interest is the most important source for the Czech Republic and Hungary (around 75%), the UK and Greece (70%), Spain, Romania and Ireland (between 65% and 50%).

Table 6.4 Structure of CREDIT CARD revenue in the EU

Incomes per credit card			
Net Interest Revenue	**Merchant Service Card Revenue**	**Card Fee Revenue**	**Other Income**
49,2%	**21,1%**	**14,4%**	**14,9%**

Source: ECB, Lafferty Consultants and own data

Income from credit interest accounts for over 40% of market revenue from credit cards in Portugal and France, and between 30% and 20% in Poland, Denmark, Slovakia and Germany. However, for the other countries studied, income from credit interest is the least important source of income and in some cases is virtually nonexistent (Italy, Finland, Austria or Sweden). These data show very different patterns of behavior among EU countries regarding the use of credit cards, as in some countries they are used to defer payments but are not really financing credit as such.

With respect to income from MSCs these represent 21.1% of total revenues for the EU average. The percentage for each country is determined by the absolute level of their MSC, by varying card use and the relative weight of the remaining sources of income. Here too there are significant differences among the countries studied, from around 50% of the total income (Annex Table A4) in Slovenia, Austria, the Netherlands and Sweden, to about 40% in Belgium and Italy, around 30% in Germany, Ireland, France, Finland, with other countries around the EU average (Denmark), to those below the average (under 21.1%) in the case of UK, Greece, Spain, the Czech Republic and Hungary. The relationship between MIFs and MSCs for credit and deferred debit is about 1 to 1.5. Thus the average EU MIF for credit operations and deferred debit operations stands at 0.67% while the MSC average is 1.02%. But again there are significant differences between countries: thus, both rates are virtually equal in Denmark (0.6%), Spain (0.66 % vs. 0.70 %) and Poland (1.5% vs. 1.6%).

Annual card fees represent a percentage of revenue of 50% in Slovakia and Italy and about a third in Finland, Netherlands, Poland and Slovenia, with the effective average

fee[29] per card being 17.6 Euros in 2011 and ranging from more than 31 Euros per card in Spain, more than 20 Euros Greece, Portugal, Germany, Italy, Finland or Netherlands, to 5 Euros per card in the UK. In Ireland such commissions are not charged[30].

Finally, Other Income (for currency exchange, refunds, withdrawals at ATMs, and so on) represent up to a third of total revenues in Belgium, Sweden, Austria, Finland and Denmark, around 20% in Germany, Ireland and Romania and around the average of 15% or less for the other countries.

Regarding expenditure, for the EU average operating costs represent around two thirds of total expenditure, while the remaining third would be costs specifically associated with credit losses. But once again the differences between countries are considerable, depending on the degree of utilization of credit and the level of fraud and unpaid in each market. Thus, the costs associated with credit account for over 50% for the UK and Ireland, and between 40% and 50% for Spain, Romania, Poland, Greece and Hungary. By contrast, this figure is less than 10% in countries such as Austria, Finland, Germany and Slovenia.

Finally, as far as the profitability indicators for 2011 (see Table 6.5) in the credit card and deferred debit card market are concerned, overall the countries of the EU had a gross margin before tax of 6,232 million Euros, representing 0.8% over total value of transactions of nearly 728 billion Euros. Measured as gross profit before tax over total revenues this stood at 18.9% with 23.1 Euros margin per card. These are the averages, but the range is very broad: the most profitable country in 2011 was Slovenia was followed by the Czech Republic, Finland, Sweden, Austria and Finland. Countries with lower profitability indicators would be Greece, Ireland and Hungary. The other countries were around the average for the whole EU.

8. Simulation of the EC proposal to reduce MIFs

In July 2013 the European Commission presented a proposal for a Regulation[31] regulating different issues related to MIFs. Specifically, the Commission proposes reducing MIFs first for cross-border transactions (Article 3 of the Regulation) and then, two years later, also for domestic transactions (Article 4 of the Regulation). The Commission presents this proposal because it understands that MIFs are agreed between

[29] Many financial institutions have reported higher annual card maintenance fees, but the concept that we are dealing with in this study is the effective average maintenance fee, calculated as the ratio between this revenue and the total number of credit cards. For example, the theoretical average of credit card maintenance fees in the UK is 25 euros while the effective average is just 5 euros, since many institutions do not charge such fees to their preferential customers.

[30] In Ireland there is the government fee (stamp duty) charged for debit/credit although this is not a revenue stream for the bank as they collect from the cardholder and pay to the Irish government.

[31] "*Propuesta de Reglamento del Parlamento Europeo y del Consejo sobre las tasas de intercambio para operaciones de pago basadas en una tarjeta*". Brussels, 24.7.2013 COM(2013) 550 final

issuers and acquirers of services , but are paid by merchants as MSCs and these, in turn, are passed on to their customers. But such arranged MIFs are high and thus generate an artificial increase in prices. Therefore, the Commission wants to limits MIFs, generating savings estimated at 6,000 million Euros annually in commissions paid as MSCs by business, trusting that this cost reduction will be passed on to the final consumer. Specifically, the proposal of the European Commission is the reduction for all Member States of MIFs for debit transactions to a single rate of 0.2%, and of 0.3% for credit transactions. Also a good number of legislative changes (which we will not discuss in this paper) are proposed, in order to promote competition and encourage the development of the payment cards market.

8.1 Our two scenarios and estimates

We would suggest that the Commission's proposal seems very interesting and share the Commission's concern and interest in increasing the penetration of cards as a means of payment and their wider use on the part of European consumers; promoting transparency and competitiveness may be an appropriate way to achieve this. From the income statements of each Member State of the EU, discussed in the previous section, we have simulated the effects of this reduction on the market for credit cards and deferred debit cards, with the two MIF and MSC scenarios that we presume may best reflect the responses of the agents involved over the coming years.

The objective of the Commission would be to reduce MIFs and that this reduction would be transferred to each Member State's MSC, which is what businesses end up paying and what impacts on final consumer costs. But, as we saw in the previous section, the relationship between MIFs and MSCs in the EU is 1 to 1.5, on average. Thus we might usefully simulate the impact on credit transactions of a reduction in MIFs to 0.3% and in MSC to 0.45%. An alternative scenario, which would also be interesting given that the philosophy of the Commission as expressed in this Regulation would be to end up abolishing MIFs and MSCs in card transactions, would be to assume that under the proposed reform MSCs for credit also would be set at 0.3%.

As we have already noted, the effective EU average MSC in 2011 was 1.02%, which generated a volume of commissions (and payments) in the business sector of approximately 6.9 billion Euros. The effect of moving to a MSC average of 0.3% would be to reduce these fees by 4,909 billion Euros per year[32].

Analyzing this effect in isolation, our estimates for the impact of the reduction of MIF and MSC would be that the annual revenue before taxes of all EU operators would be reduced by € 4,909 billion and the overall profitability of the industry would go from 18.9% to 4%. If we study the impact by country we see that 7 of the 20 countries surveyed would have negative returns (in order of lower profitability, Netherlands, Ireland, Italy, Austria, Poland, Hungary and Denmark); and other countries like

[32] In the Impact Assessment document (Commission Staff Working Document, 2013) the European Commission estimates the same impact, when calculated on MIFs, at 3,506 million euros.

Germany, Greece, Sweden, the United Kingdom, France and Belgium would suffer very high losses in profitability, down to virtually zero.

Table 6.5. Profitability indicators EU 2011 and Simulation Credit MSC = 0.3%

	YEAR 2011			Simulation MSC = 0.3%		
	Profits before Tax / Billed Volume	**Profits before Tax (€ per card)**	**Profit margin**	**Profits before Tax (€ per card)**	**Profit margin**	**Lost of revenues (Mill.€)**
Austria:	1,1%	42,4	38,1%	-2,7	**-4,1%**	-120
Belgium:	0,8%	16,6	29,7%	0,9	**2,3%**	-64
Denmark	0,3%	10,6	10,2%	-0,3	**-0,3%**	-17
Finland:	1,2%	23,2	39,3%	11,9	25,0%	-57
France:	0,5%	30,6	23,7%	6,0	**5,7%**	-1087
Germany	1,1%	20,9	26,2%	1,2	**1,9%**	-523
Greece:	0,8%	17,2	7,5%	3,9	**1,8%**	-69
Ireland:	0,1%	4,2	2,1%	-35,7	**-21,7%**	-85
Italy:	0,7%	12,1	24,6%	-2,6	**-7,6%**	-504
Netherlands:	0,7%	15,5	22,2%	-10,6	**-24,1%**	-155
Portugal:	1,4%	16,9	21,8%	5,5	8,3%	-105
Spain:	1,4%	21,8	16,5%	16,4	12,9%	-230
Sweden:	1,1%	37,9	39,1%	3,4	**5,4%**	-325
United Kingdom	1,1%	28,0	14,4%	5,1	**3,0%**	-1401
Czech Rep.	5,2%	64,3	40,5%	55,7	37,1%	-15
Hungary:	0,5%	4,1	3,1%	-0,8	**-0,6%**	-6
Poland:	0,7%	6,8	10,5%	-1,7	**-3,1%**	-83
Romania:	0,9%	10,4	17,4%	5,7	10,4%	-10
Slovakia:	1,9%	15,7	33,3%	11,2	26,2%	-4
Slovenia	1,4%	25,4	43,4%	3,8	10,4%	-28
TOTAL EU 20	**0,8%**	**23,1**	**18,9%**	**4,9**	**4,0%**	**-4909**

Source: Own calculations.

In countries with lower MSCs, such as Spain, the impact would be less significant; likewise in those countries where the MSC is a minor source of revenue, such as the Czech Republic, Romania and Slovakia.

The greatest annual revenue loss caused by the reduction of MIFs and MSCs would occur in the United Kingdom (€ 1,400 million loss), followed by France (about €1,100 million) and Germany and Italy (more than €500 million).

For this simulation we have assumed that the sector would not be able to reduce its costs and would not compensate for the reduction in MIFs by increasing income from other sources. Of course, the capacity of domestic markets to assimilate this reduction in income is very different in each country, depending on their particular characteristics. In Iranzo *et al* (2012) we analyzed the experience of the reduction of MIF and MSC in Spain by more than 50% between 2006 and 2010: the most important consequence was that the reduction of MIFs received by issuing banks was shifted to the MSCs paid by merchants, as was to be expected, but this reduction in MSCs brought about a strong compensatory increase of more than 50% in annual card fees paid by consumers. As a consequence, no effective cost reduction reached the consumer, who continued to pay about the same. But with a significant increase in consumer costs, the penetration of payment cards in Spain and their employment by end users is not increasing (it should be recalled that the consumer ends up paying all costs in the final price, but MSCs are not perceived by consumers as a cost, unlike annual fees) .

The alternative simulation in which reducing MIFs to 0.3% would imply that MSCs will move from 1.02% to 0.45% (keeping the ratio of 1 to 1.5 MIF-MSC), would have less impact, reducing profitability in the EU credit card market by around €3,900 million. The rate of return, measured as gross profit before tax on total income would go from 18.9% in 2011 to 6.2% (compared to a drop to 4% with the reduction of the MSC also to 0.3%, as discussed above).

9. Conclusions

The payment cards market is a good example of the so-called two-sided market. These markets are characterized by: 1) two sets of agents interacting through a platform, and 2) the decisions of each set of agents affect the other group, usually through network economies and externalities.

In this paper we have analyzed recent theoretical studies on two-sided markets, particularly those that focus on the study of pricing mechanisms and those related to the payment cards market.

One of the most controversial issues in the payment cards market is fixing of Multilateral Interchange Fees in four-party systems between banks acquiring and banks issuing payment cards. In our study we analyzed a large number of interventions in different countries aimed at reducing MIFs.

Specifically, we studied the proposed regulation presented by the European Commission in July 2013 which, among other things, aims to reduce MIFs to a single rate of 0.2% for debit transactions and 0.3% for credit transactions, first for cross-border transactions and, two years later, also for domestic operations The Commission presents this proposal because it believes that the MIFs agreed between issuers and acquirers are too high and generate an artificial increase in prices. Through this measure the

Commission wishes to promote the penetration of payment cards and facilitate their use by European consumers.

In conducting our study we built a database that allowed us to calculate the profit and loss account of the credit card and deferred debit card market across the whole European Union (38% of the total card payments market in 2011) and of its 20 major domestics markets. These profit and loss accounts show that the payment cards markets in the EU are very different and more varied than might be thought. The MIFs are by no means the largest source of revenue, accounting for just over 21.1% of total revenues in the EU on average and between 5% and 50% in different European countries. In addition, the habits of card use in the EU countries are also very varied, with some countries using them to make more than 200 payments per inhabitant per year, compared with others where this figure is less than 10. As a result of this, the impact of this reduction in MIFs would have very different consequences for different countries. For the EU as a whole it would mean a significant reduction in profitability (calculated as profit before taxes on total income), which would decrease from 18.9 % to 4 %. This would suggest a reduction of revenue for the sector of about 4,900 million Euros annually, which we would find very interesting if it implied a reduction in costs to the consumer. But the point is that in analyzing the consequences, seven countries would have negative returns and five would be located very close to the zero profitability thresholds. This would mean that they would have to put into action some mechanism to compensate for this loss of revenue. Unfortunately experiences in several countries (such as Spain and Australia) have shown that reductions in MIFs and MSC in countries with narrow margins invariably lead to compensatory increases in other revenue sources such as annual fees, cash withdrawal fees at ATMs , and so on.

As a result, the consumer has received no benefit at all from these measures. The consumer has not seen a reduction in costs: on the contrary, the perception has been of an increase in the price he has to pay for using cards, given the fact that any reductions in prices by businesses is very minimal and is applied to the totality of goods consumed, while in strong contrast, instead of facilitating a greater use of cards these measures have caused the opposite and undesired effect.

Appendix 1. Methodology of the study

Statistical information on payment cards in the EU is somewhat scarce and not very homogeneous. Banking and financial information is reported to the Central Banks of the Member States, but while the Central Banks of some countries regularly publish national reports with the most important data for this sector (for example, Bank of Spain), in other countries it is very difficult to access official information. In addition to the domestic reports, the European Central Bank (ECB)[33] and the Bank for International

[33] European Central Bank (2012), *Payments Statistics,* June.

Settlements (BIS)[34] also publish annual reports with some information relevant to this sector.

Private sources of information, usually those developed by prestigious international consulting firms, which allow some gaps in official statistical data to be filled, are also very useful; notably, Lafferty Consultants, Euromonitor, European Data, Datamonitor, DBK, Tatumm.

In the official sources we can find data on the number of payment cards, number of transactions made or turnover at point-of-sale (POS) terminals and cash withdrawals at automated teller machines (ATMs) as well as some ratios which allow comparison between countries (data *per capita*, calculations in relation to GDP in each country, etc.). However, for some countries the information is very limited. For example, the distinction between transactions with credit cards and debit cards[35] is not the same in all countries. Thus, both the ECB and the BIS classify the total number of payment cards into five categories:

1. Cards with a debit function
2. Cards with a delayed debit function
3. Cards with a credit function
4. Cards with a debit and/or delayed debit function
5. Cards with a credit and/or delayed debit function

This classification exists because the operation in the use of debit cards, deferred debit cards and credit cards among the different European countries is different. So complex is this issue that for France (the second largest payment cards market in the EU) where the volume of payments is not recorded in the official statistics, nor is any there any differentiation between debit cards and credit cards, and with respect to the number of the card the data is recorded in each and every one of the five categories listed; on the other hand, in other countries such as Spain, Belgium and Finland information only appears in one category for debit cards (usually 1) and one for credit cards (usually 5), without which it would be possible to identify the volume of deferred debit payments.

What does this imply? The criteria used in these studies are to assimilate and compute jointly the deferred debit card and credit card data. But depending on the criteria used to classify deferred debit in these five categories we find studies indicating that in France, credit cards are relatively little used (less than 10%) and other studies showing the exact opposite: that France's use of credit cards (in addition to estimates of deferred debit

[34] Bank for International Settlements (2013), *Statistics on payment, clearing, and settlements system in the CPSS countries*. January.

[35] In Regulation COM (2013) 550 final, the European Commission defines "debit card transaction" as a payment card transaction, including those made with prepaid cards linked to a checking/current account or a deposit account, with the amount owed being settled within a period not exceeding 48 hours after authorization or the beginning of the operation; and "credit card transaction" is defined as a payment card transaction whose amount is settled within more than 48 hours after the authorization or the beginning of the operation.

cards) is the highest in the EU (68% of the total volume of payments). This has a crucial impact on the study, because depending what criteria we use, the volume of payments in EU credit card and deferred debit card transactions could be just under € 500 billion or as much as €728 billion (i.e. about 50% higher).

In respect to the official statistics on domestic MIFs and MSCs in different countries, it is virtually impossible to find accurate information, with some exceptions, such as the Central Bank of Spain. And of course, it is also rare to find detailed official information about other sources of income of the payment cards market (total income from credit interest, annual card maintenance fees, fees for other items, operating costs, and so on). This information is only available from market research conducted by specialist consultancies.

For methodological purposes we chose to use the same data on volume of payments, differentiating between debit cards and credit cards plus deferred debit cards, as those used in the Impact Assessment undertaken by the European Commission[36] (source: ECB and its own estimates for France) and also data from the MIFs of this study. We have supplemented this information with some partial data from some specialist consultancies (Lafferty Consultants, Euromonitor, European Data, Datamonitor, DBK, Tatumm, etcv.), in particular data on the structure of the different European markets shown in section 6 of this paper. By doing this we are able to avoid the important differences which appear among these alternative sources of information, and our results can be easily compared with those used in the Impact Assessment of the European Commission.

[36] Commission Staff Working Document (2013), *Impact Assessment.* Accompanying the document Proposal for a Directive of the European Parliament and of the Council on payment services in the internal market and amending Directives 2002/65/EC, 2013/36/UE and 2009/110/EC and repealing Directive 2007/64/EC and Proposal for a Regulation of the European Parliament and of the Council on interchange fees for card-based payment transactions. Brussels, July, SWD (2013) 288 final.

Appendix 2 of Tables

Table A1. 2011

	TOTAL Billed Volumes at POS	Billed Volumes DEBIT	Billed Volumes CREDIT	% Credit / Total	Per capita TOTAL B. V. at POS	Per capita Debit B. V. at POS	Per capita Credit B. V. at POS
Austria	27948	16503	11445	41,0%	3,325	1,964	1,362
Belgium	63299	50376	12923	20,4%	5,754	4,579	1,175
Czech Republic	10128	8880	1248	12,3%	0,966	0,847	0,119
Denmark	53921	47675	6246	11,6%	9,697	8,574	1,123
Finland	36099	30483	5617	15,6%	6,716	5,671	1,045
France	393594	121813	271782	69,1%	6,056	1,874	4,182
Germany	187631	139142	48489	25,8%	2,295	1,702	0,593
Greece	6542	1101	5442	83,2%	0,578	0,097	0,481
Hungary	6414	5454	959	15,0%	0,642	0,546	0,096
Ireland	23572	12900	10672	45,3%	5,157	2,822	2,335
Italy	122606	67006	55600	45,3%	2,022	1,105	0,917
Netherlands	96243	85113	11131	11,6%	5,778	5,110	0,668
Poland	25593	18973	6620	25,9%	0,664	0,492	0,172
Portugal	55733	46117	9616	17,3%	5,272	4,362	0,910
Romania	4819	3972	847	17,6%	0,225	0,185	0,040
Slovakia	7717	7095	622	8,1%	1,431	1,316	0,115
Slovenia	4537	2815	1721	37,9%	2,213	1,373	0,840
Spain	107295	45198	62096	57,9%	2,325	0,979	1,345
Sweden	84820	63632	21188	25,0%	9,008	6,758	2,250
United Kingdom	578332	401739	176593	30,5%	9,251	6,426	2,825
Bulgaria	1122	713	409	36,4%	0,152	0,097	0,055
Cyprus	3301	1595	1706	51,7%	3,930	1,899	2,031
Estonia	3153	2643	509	16,2%	2,352	1,972	0,380
Latvia	2338	1583	755	32,3%	1,127	0,763	0,364
Lithuania	1958	1475	483	24,7%	0,642	0,483	0,158
Luxembourg	5667	2394	3273	57,8%	11,072	4,678	6,395
Malta	864	446	418	48,4%	2,078	1,072	1,006
TOTAL UE	1915245	1186837	728408	38,0%	3,812	2,362	1,450
units	millions euros	millions euros	millions euros	%	000 euros	000 euros	000 euros

Source: ECB and own calculations.

Table A2. 2011

	TOTAL Number of cards	DEBIT total cards	CREDIT Total Cards	Per capita TOTAL cards	Per capita DEBIT cards	Per capita CREDIT cards
Austria	11,053	8,303	2,751	1,3	1,0	0,3
Belgium	20,005	15,707	4,298	1,8	1,4	0,4
Czech Republic	9,815	7,988	1,827	0,9	0,8	0,2
Denmark	7,563	6,097	1,466	1,4	1,1	0,3
Finland	7,825	4,193	3,632	1,5	0,8	0,7
France	83,005	38,928	44,077	1,3	0,6	0,7
Germany	130,585	103,957	26,628	1,6	1,3	0,3
Greece	13,794	9,614	4,180	1,2	0,9	0,4
Hungary	8,888	7,681	1,207	0,9	0,8	0,1
Ireland	5,907	3,770	2,137	1,3	0,8	0,5
Italy	67,355	37,550	29,805	1,1	0,6	0,5
Netherlands	30,456	24,445	6,011	1,8	1,5	0,4
Poland	32,045	24,785	7,260	0,8	0,6	0,2
Portugal	20,120	10,006	10,114	1,9	0,9	1,0
Romania	13,349	11,182	2,166	0,6	0,5	0,1
Slovakia	5,337	4,522	0,816	1,0	0,8	0,2
Slovenia	3,285	2,503	0,782	1,6	1,2	0,4
Spain	68,970	27,079	41,891	1,5	0,6	0,9
Sweden	20,271	10,264	10,007	2,2	1,1	1,1
United Kingdom	147,235	86,325	60,910	2,4	1,4	1,0
Bulgaria	7,986	7,007	0,979	1,1	1,0	0,1
Cyprus	1,314	0,756	0,557	1,6	0,9	0,7
Estonia	1,778	1,409	0,369	1,3	1,1	0,3
Latvia	2,323	1,841	0,482	1,1	0,9	0,2
Lithuania	3,886	3,480	0,406	1,3	1,1	0,1
Luxembourg	1,694	0,782	0,911	3,3	1,5	1,8
Malta	0,729	0,553	0,176	1,8	1,3	0,4
TOTAL UE	726,572	460,727	265,845	1,4	0,9	0,5
units	millions	millions	millions			

Source: ECB and own calculations.

Table A3. 2011

	TOTAL Card Payments	DEBIT Card Payments	CREDIT Card Payments	TOTAL average payment	DEBIT average payment	CREDIT average payment	Per capita TOTAL paymen	Per capita DEBIT payment	Per capita CREDIT payment
Austria	446	329	117	62	50	97	53	39	14
Belgium	1154	1021	133	54	49	96	105	93	12
Czech Republic	269	238	30	37	37	40	26	23	3
Denmark	1201	1116	84	44	42	74	216	201	15
Finland	1092	995	96	33	30	57	203	185	18
France	7911	3327	4584	49	37	59	122	51	71
Germany	2948	2405	542	63	57	89	36	29	7
Greece	74	13	61	87	84	88	7	1	5
Hungary	232	204	27	27	26	35	23	20	3
Ireland	339	238	102	69	54	105	74	52	22
Italy	1567	981	585	78	68	94	26	16	10
Netherlands	2444	2334	110	39	36	100	147	140	7
Poland	1026	827	199	24	22	33	27	21	5
Portugal	1237	1004	233	45	45	41	117	95	22
Romania	130	107	22	36	36	36	6	5	1
Slovakia	152	139	13	50	50	47	28	26	2
Slovenia	121	80	41	37	35	41	59	39	20
Spain	2386	1062	1324	44	42	46	52	23	29
Sweden	1951	1606	345	43	39	61	207	171	37
United Kingdom	9901	7612	2289	58	52	77	158	122	37
Bulgaria	28	19	9	39	38	42	4	3	1
Cyprus	39	20	19	84	79	89	46	24	23
Estonia	197	179	18	15	14	27	147	134	14
Latvia	114	92	21	20	17	34	55	44	10
Lithuania	107	95	11	18	15	41	35	31	4
Luxembourg	71	38	34	79	63	97	139	74	66
Malta	14	8	4	62	50	84	33	19	10
TOTAL UE	37154	26090	11064	51	45	66	74	52	22
units	millions	millions	millions	euros	euros	euros	euros	euros	euros

Source: ECB and own calculations.

Table A4.

	% Merchant Service Card Revenue	Average MIF Credit	Average MSC Credit	% Card Fee Revenue
Austria	50,3%	1,00%	1,55%	20,6%
Belgium	39,3%	0,76%	1,05%	14,4%
Czech Republic	6,7%	1,17%	1,54%	7,7%
Denmark	21,1%	0,60%	0,60%	12,3%
Finland	27,9%	0,75%	0,95%	36,6%
France	33,5%	0,28%	0,70%	10,0%
Germany	30,9%	1,20%	1,50%	27,8%
Greeece	7,6%	1,10%	1,24%	12,4%
Hungary	4,9%	0,87%	1,21%	16,6%
Irland	26,4%	0,87%	1,15%	0,0%
Italy	38,1%	0,70%	1,40%	48,7%
Netherlands	45,3%	0,81%	1,70%	29,6%
Poland	16,3%	1,50%	1,60%	31,0%
Portugal	18,7%	1,20%	1,40%	27,9%
Rumania	9,6%	1,28%	1,60%	14,0%
Slovaquia	12,8%	0,70%	1,20%	51,6%
Slovenia	52,6%	0,97%	1,00%	30,3%
Spain	7,2%	0,66%	0,70%	23,8%
Sweden	45,3%	0,86%	1,40%	14,8%
United Kingdom	15,7%	0,96%	1,20%	2,6%
TOTAL 20	21,1%	0,67%	1,02%	14,4%

Source: ECB, Lafferty Consultants and own calculations.